Amendments to the Specification

Please replace the 3rd paragraph on page 7 with the following amended paragraph:

As the radiation source 12 moves to the different angular positions θ_1 and θ_2, the detector 14 moves to corresponding angular positions in order to receive the radiation emitted by the radiation source 12. A low noise detector suitable for use in a system of the invention is described in U.S. Patent No. 6,448,544 entitled "Low noise, high resolution image detection system and method," herein incorporated by reference. Referring to Fig. 1, the detector 14 converts the incident radiation from the radiation source 12 into radiation transmission data 28. The radiation transmission data 28 represents the measured intensity of the radiation transmitted through the target scene 24 for each angular position of the radiation source 12. The radiation transmission data 28 is processed by the image processor 20 to create a three-dimensional image of the target scene 24 and the object 22 within the target scene 24.

Please replace the 2nd paragraph on page 19 with the following amended paragraph:

In one embodiment, the detector 14 is a low-noise digital detector. Using a low-noise detector has the effect of lowering the total dose of radiation applied to the object 22. The disadvantage of taking N low-dose images rather than a single integrated image is the increase in read noise. For a detection system having high read noise, such as screen-film, high doses of radiation are required in order to achieve an acceptable SNR as the number of images increases. Using a low-noise detector enables a larger number of images to be collected with the same total dose as a single exposure without significantly degrading the SNR. Using the low-noise detector described in U.S. Patent No. 6,448,544, a single exposure of 2000 x-ray photons /pixel generates a SNR of approximately 31. Collecting 10 images using the same total dose decreases the SNR to approximately 30, and collecting 100 images with the same total dose decreases the SNR to approximately 22. Therefore, utilizing very low noise digital detectors allows collection of multiple projections for CT reconstruction without incurring a large noise penalty.

Please replace the 2nd paragraph on page 17 with the following amended paragraph:

Each time one of the photodetectors 172 or pixels is read by the read out electronics a certain amount of error is introduced. One method for reducing the resolution of the photodetector array 172, is to read out two pixels P_1 and P_2 individually and then average the values. This process is then repeated for the next two pixels P_3 and P_4 until all of the pixels are read. By averaging the values of sets of two pixels, the resolution of the detector is reduced by ½. Other quantities of pixels may be averaged to attain different resolutions. If each pixel has a read noise of σ_R, the error introduced is equal to $(N)^{1/2}\ \sigma_R$ where N is the number of pixels averaged.